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Superconducting gap of MgB_2 observed using ultra-high resolution photoemission spectroscopy

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Recently, Akimitsu et al. discovered that MgB_2 shows superconductivity below 39 K [1]. This discovery is surprising because of its high transition temperature occurring in a simple binary compound and has been stimulating further experimental and theoretical studies to understand the mechanism of superconductivity.

In this paper, we show ultrahigh-resolution photoemission results of MgB_2. Photoemission spectrum measured at 45K shows a Fermi edge whose reading edge midpoint locates at the Fermi level. In contrast, the spectrum measured at 5.3 K shows a clear superconducting quasiparticle peak at $\sim$8 meV and a shift of reading edge, indicating opening of a superconducting gap. We will discuss the value of superconducting gap and its temperature dependence.

[1] J.Nagamatsu et al. Nature **410,** 63 (2001).